

Homework Set 2

DUE: FEB 27, 2017 (IN CLASS)

1. Shifrin (page 31): Exercise 1 (a), (b)
2. Shifrin (page 33): Exercise 12
3. Shifrin (page 41): Exercise 2, 4 (a), (c)
4. Shifrin (page 42): Exercise 5, 6, 7
5. Let $M = \{(u, v, f(u, v)) : u, v \in \mathbb{R}\}$ be the graph of a smooth function $f: \mathbb{R}^2 \rightarrow \mathbb{R}$.
 - (a) Determine a formula for the Gauss curvature and mean curvature of $M \subset \mathbb{R}^3$.
 - (b) Compute the Gauss curvature and mean curvature of the *paraboloid* given by the graph of $f(u, v) = u^2 + v^2$, and of the *saddle* given by the graph of $f(u, v) = u^2 - v^2$.
 - (c) What is the asymptotic behavior of these quantities as $\|(u, v)\| \rightarrow \infty$?
6. CHALLENGE PROBLEM (OPTIONAL)
Shifrin (page 44): Exercise 17